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RIO Country Report 2017

The R&I Observatory country report 2017 provides a brief analysis of the R&I system covering the economic context, main actors, funding trends & human resources, policies to address R&I challenges, and R&I in national and regional smart specialisation strategies. Data is from Eurostat, unless otherwise referenced and is correct as at January 2018. Data used from other international sources is also correct to that date. The report provides a state-of-play and analysis of the national level R&I system and its challenges, to support the European Semester.

Summary

Slovenian GERD declined in 2016 to €809m or 2.0% of GDP, primarily due to the lower funding of R&D activities by the business sector (Eurostat provisional data). A small increase in GBAORD (€2.9m) did not offset this trend, which was expected due to the delays in the implementation of the smart specialisation strategy. The legal framework for R&D activity saw limited progress in 2017- a draft law was presented for public consultation in the autumn of 2017, receiving numerous comments from stakeholders. Real GDP increased by 4.8% in the first half of 2017 surpassing its pre-crisis peak. Growth is forecast to increase to 4.7% in 2017, 4.0% in 2018 and 3.3% in 2019. The unemployment rate is expected to decline to around 5.2% in 2019 (EC, 2017a).

Challenges for R&I policy-making in Slovenia

1. **Ensuring the sustainability of R&D&I funding.** The Research and Innovation Strategy of Slovenia planned a constant increase in the resources for R&D, in order to achieve the Europe 2020 target of 3% of R&D intensity. However, in 2016, GERD was at 2.0%, a decline from 2.58% achieved in 2013. Only a very slow increase of GBAORD is planned in the budget for 2017-2018.
2. **Development of a well co-ordinated and transparent R&I governance.** Slovenia lacks an effective governance structure for R&I due to weak coordination across responsible departments and collaborative links between major stakeholders in innovation policy. Yet, no change has been observed in this area except for the new coordination body for the implementation of RIS3.
3. **Human resources in S&T.** Slovenia has managed to increase the enrolment of youth in tertiary education significantly. With special measures to promote doctoral studies, the number of students engaged in them has increased too. With the diminishing public resources for R&D, Slovenia experienced a situation of a much larger outflow of PhDs than the research sector was able to absorb. This led to increased unemployment among the high-skilled, with some leaving to find jobs abroad and others accepting work below their qualifications level.

Main R&I developments in 2017

- **Draft law on R&D.** MESS presented draft law on R&D in end of Oct. for public discussion till end of November. In view of numerous comments received from various science communities the text of the Law has only been submitted to other ministries in end January 2018.
- **Action plans of Strategic Research & Innovation Partnerships (SRIPs).** Following the initial call in Dec. 2016, the nine SRIPs selected by GODC prepared their Action Plans, which were approved by the coordination body and published in July 2017.
- **Policy Support Facility (PSF).** The Slovenian authorities are using the PSF under Horizon 2020 to address the issues of internationalisation of Slovenian science and improve the cooperation between the science base and business. A second draft was submitted to the Slovenian authorities by end of the summer, but the final report has not yet been submitted by the expert group.

Smart specialisation

Slovenia adopted its Smart Specialisation Strategy (RIS3) in 2015. RIS3 identifies three priority areas: a) Digital, b) Circular and c) (S)Industry 4.0. Delays in the preparation of RIS3 have also resulted into a delay in implementation. Over the period 2016 – 2018, Slovenia plans to invest €1.9b through the Operational Programme in accordance with the thematic priorities of the Smart specialisation strategy (RIS3) (€1b on R&D&I, €0.8b on entrepreneurship and €0.05b on human resources).

Foreword

The R&I Observatory country report 2017 provides a brief analysis of the R&I system covering the economic context, main actors, funding trends & human resources, policies to address R&I challenges, and R&I in national and regional smart specialisation strategies. Data is from Eurostat, unless otherwise referenced and is correct as at January 2018. Data used from other international sources is also correct to that date. The report provides a state-of-play and analysis of the national level R&I system and its challenges, to support the European Semester.

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1 Economic context for R&I

The Slovenian economy continued to experience solid growth in 2016 and GDP per capita reached €19 300. Real GDP expanded by 3.1 % in 2016, after a 2.3 % growth in 2015. It was driven by exports, private consumption and investment (EC, 2017a). Economic growth further accelerated in 2017: real gross domestic product (GDP) in the first half of 2017 increased by 4.8% and surpassed its pre-crisis peak. In the third quarter of 2017 GDP increased by 4.5% over the third quarter of 2016. Seasonally adjusted GDP increased by 1% over the previous quarter and by 4.9% over the third quarter of 2016 (SORS 2017a, release on GDP, 30/11/2017¹).

The rebound that has taken place since 2014 was initially driven by strong export performance supported by improved cost competitiveness. Subsequently, the recovery was supported by increased private consumption² and private investment³, improving labour market, rising consumer confidence and continued low energy prices. Growth is forecast to accelerate to 4.7% in 2017, 4.0% in 2018 and 3.3% in 2019 (EC, 2017a). It remains broad-based with a further shift from external to domestic demand.

High growth of exports and imports continues; in the second quarter, exports increased by 8.3%; while imports increased by 7.9%. The external trade surplus has stimulated economic growth (SORS, 2017a)⁴. Solid growth of economy depends on export activity, while the state-owned entities have underperformed compared to their privately owned peers in terms of productivity and profitability.

The general government deficit decreased to 1.9 % of GDP in 2016 and is expected to decline further to 0.8 % in 2017 based on public investment, tax revenues and social contributions. For 2018 a government balance (0.0%) is expected, mainly due to economic growth and improved market conditions (EC, 2017a). Slovenian public debt peaked at 82.6 % of GDP in 2015 and is projected to gradually decline to 74.1 % of GDP in 2018. (EC, 2017a). Inflation in Slovenia in the past two years was among the lowest in the euro area.

Simultaneously with the economic recovery, conditions in the labour market are also improving. In the second quarter of 2017 total employment increased by 2.8% over the second quarter of 2016. Employment growth remains high in most sectors as increasing exports, consumption and investment boost labour demand in the economy. Employment is expected to continue to grow by 1%-2%, but decelerate as labour shortages increase in the tightening labour market. As a result, the unemployment rate is expected to decline from 8% in 2016 to 5.2% in 2019. As the forecast unemployment rate approaches its natural rate, wage pressures are set to rise.⁵ (EC, 2017a). Recruitment is expected to be higher in export-oriented sectors, construction and services (Bank of Slovenia, 2017). Labour productivity growth (in terms of gross value added per hours worked) dropped to 1.0 % in 2010-2015, however both labour productivity and total factor productivity increased again in 2016⁶ and is forecast to increase also in 2017 and 2018 (EC 2017b: 9).

¹ <http://www.stat.si/StatWeb/en/Field/Index/1>

² Final consumption expenditure went up by 2.7% (in the first quarter by 3.3%) and gross fixed capital formation by 7.4% (in the first quarter by 14.1%) (see <http://www.stat.si/StatWeb/en/Field/Index/1>). Positive impact on gross fixed capital formation growth was due to increased construction investment and gross fixed capital formation in other machinery and equipment.

³ Investment increased by 10% in the first half of 2017 and is expected to grow further due to the combination of strong external and domestic demand with improving financing conditions and corporate balance sheets. The improved use EU funds may boost investment further in 2018 and 2019 (EC, 2017d).

⁴ <http://www.stat.si/StatWeb/en/Field/Index/1>

⁵ Compensation per employee is expected to grow by 2.8% in 2017 and around 3.2% in 2018/2019.

⁶ Potential growth in 2016 is estimated at 1 %, compared to 3-4 % between 2000 and 2008 (2017 European Semester Country Report for Slovenia).

Table 1. Main economic indicators

	2009	2010	2011	2012	2013	2014	2015	2016	2017
GDP per capita (euro per capita)	17700	17700	18000	17500	17600	18200	18800	19600	
GDP growth rate (% change)	-7.8	1.2	0.6	-2.7	-1.1	3	2.3	3.1	
Budget deficit as % of GDP	-5.8	-5.6	-6.7	-4	-14.7	-5.3	-2.9	-1.9	
Government debt as % of GDP	34.6	38.4	46.6	53.8	70.4	80.3	82.6	78.5	
Unemployment rate as percentage of the labour force	5.9	7.3	8.2	8.9	10.1	9.7	9	8	6.8
Value added of services as share of the total value added (% of total)	66.72	67.41	66.79	66.26	65.96	64.85	65.09	65.52	
Value added of manufacturing as share of the total value added (%)	19.56	20.16	20.96	21.6	22.22	22.88	23.08	23.24	
Value added of knowledge-intensive services as share of total value added (%)	36.34	37.35	36.82	36.43	35.45	34.93	34.83	35.01	
Value added of High and Medium-High Tech manufacturing as share of total value added (%)	8.7	9.38	9.64	10.08	10.25	10.41	10.43	10.22	
Employment in knowledge-intensive service sectors as share of total employment (%)	32.94	34.32	35.13	35.73	36.16	36.55	36.72	36.97	
Employment in High and Medium High Tech manufacturing sectors as share of total employment (%)	7.07	6.95	7.02	7.09	7.01	7.09	7.06	6.97	
Employment in manufacturing as share of total employment (%)	21.21	20.34	20.61	20.48	20.28	20.25	20.28	20.48	
Employment in services as share of total employment (%)	59.08	60.56	61.18	61.74	62.26	62.55	62.8	63.22	
Share of Foreign controlled enterprises in the total nb of enterprises (%)	1.94	1.95	3.73	4.14	4.53	5.09	5.35		
Business Structure of the economy: Share of "From 0 to 9 persons employed" enterprises (%)		93.6	93.92	94.2	94.59	94.67			
Business Structure of the economy: Share of "From 10 to 19 persons employed" enterprises (%)		3.34	3.16	3.09	2.86	2.85			
Business Structure of the economy: Share of "From 20 to 49 persons employed" enterprises (%)		1.8	1.73	1.59	1.51	1.48			
Business Structure of the economy: Share of "From 50 to 249 persons employed" enterprises (%)		1.06	1	0.94	0.87	0.83			
Business Structure of the economy: Share of "250 persons employed or more" enterprises by size class		0.2	0.19	0.19	0.17	0.16			
Entrepreneurship performance indicator: Firms birth rate (Number of enterprise births divided by the number of enterprises active)	11.84	10.8	10.58	10.37	13.68	11.46	11.21		
Entrepreneurship performance indicator: Firms death rate (Number of enterprise deaths divided by the number of enterprises active)	7.53	8.5	8.3	9.21	9.1	8.25	7.86		
Entrepreneurship performance indicator: Firms survival rate(3 yrs threshold) (Number of enterprise births divided by the number of enterprise births in t-3)	73.95	69.77	65.46	61.51	62.46	61.94	63.19		
Labour productivity (Index, 2010=100)	96.8	100	103.4	102.7	101.6	103.1	103.7	106.3	
Innovation output indicator (Rank, Intra-EU Comparison)			16	15	17	18			
Summary Innovation Index (score, relative to EU28 2010 = 100)	97.1	97.97	99.35	97.91	97.39	98.72	97.98	97.8	
Summary Innovation Index (rank)	12	12	12	12	12	12	12	12	

1.1 Structure of the economy

The structure of Slovenian business sector is relatively stable over the last five years. In 2015 most of employment (62.8%) and value added (64.55%) was provided by services vs 20% and 23% respectively coming from the manufacturing sector.

Knowledge-intensive services in 2015 provided 35% of total value added and about 37% of total employment. High-tech and medium-tech manufacturing kept a stable share in value added and employment (10.4 % and 7% respectively) over last three years.

Foreign-owned companies in 2015 represented 5.4 % of business sector and generated 26.3% value added and 20% of employment of all enterprises in Slovenia (SORS, 2017b; BS, 2016).

1.2 Business environment

The recovery and changes of the Slovenian business environment after the global economic crisis are slow and modest. While some general issues such as trading across borders, paying taxes, registering property, getting electricity, resolving insolvency, launching a business, etc. are comparable to regional average (OECD high income) and competitive within the EU region, the major weakness hindering development is the quality of institutions, particularly legal institutions and their progress (Kunčič, 2012, WEF GCI, 2017).

Slovenia ranks 37th in the World Bank doing business ranking, down from 30th in 2017. The weakest areas continue to be contract enforcement and getting credit (WB doing business, 2018). Progress is seen also in competitiveness, as the Global Competitiveness Index 2016–2017 showed improvement to 56th place from 59th in 2015–2016. Slovenia is seen as innovation-driven economy, yet among lower global competitiveness index (GCI) performers. Within the three studied areas of the global competitiveness index, the innovation and sophistication factors and basic requirements are evaluated higher than efficiency enhancers. A deeper insight reveals comparative strengths in health and primary education and innovation and major weaknesses in institutions, labour market efficiency and development of financial markets.

Out of 128 countries Slovenia ranks 32nd in the Global Innovation Index in 2017 (GII, 2017). The absence of rule of law, rigid labour market and highly taxed skilled labour are also found among the most important and persistent weaknesses of business environment among foreign investors in Slovenia, while the most important barriers identified were unpredictable tax procedures. Still, the 2016 survey demonstrated increased investment plans for 2017 compared to the previous year.⁷

The most important assets of Slovenian business environment according to foreign investors are the quality of labour and the width and depth of employees' knowledge (including intercultural communication and digital literacy⁸ as the areas in which employees are the most proficient). The country's human capital as a driver to invest in Slovenia has been rising over the past three years. Skills and innovation have been

⁷ More foreign investors are planning to expand in 2017 compared to their plans for 2016. Specifically, expansion in Slovenia is planned by 37.5 % of all surveyed enterprises, which is 6.4 % more than a year earlier. Only 2.3 % of enterprises plan to decrease their activities in Slovenia, while 41.7 % of businesses are assuming their activities in Slovenia to remain stable (Jaklič, et al. 2016).

⁸ See also DESI report 2017, which places Slovenia high in integration of digital technology and human capital. <https://ec.europa.eu/digital-single-market/en/scoreboard/slovenia>

estimated as a promising area (at EU average) also among small business act (SBA) principles.⁹

When it comes to challenges, these are the most important according to foreign investors: more synchronised and agile functioning of the public administration (including local administration), reinforcement of the functioning of the rule of law and increasing efficiency of the court system, reduction of taxes and contributions levied on salaries of highly qualified employees, more flexible labour market, greater emphasis on creativity and innovativeness in the education system, simplification of the tax procedures, as well as the improvement of the functioning of tax administration and greater stability of legislation (Jaklič et al., 2016 - Survey SPIRIT Slovenija, 2016).

Relevant for readiness to innovate and create value may be also the impact of economic freedom on business environment (IEF, 2017). The 2017 index of economic freedom (created by The Heritage Foundation) dropped to 59.2 from 60.6 in 2016 and ranked Slovenia on 97th place (among mostly unfree economies). Slovenia's record on structural reforms is seen as uneven; despite progress in employment and stabilisation of public finances, the institutional weaknesses continue to undermine prospects for long-term economic development. In particular, the judicial system remains inefficient and vulnerable to political interference (<http://www.heritage.org/index/country/slovenia>).

Sloveniaranks 17th in DESI 2017, with significant progress in the integration of digital technologies by enterprises, an area where the country now ranks above EU average. Digital skills levels have improved and Slovenians engage in a variety of online activities. However, connectivity remains below EU average, driven by the low take-up of fast and mobile broadband. The delivery of online public services progresses thanks to efforts in open data (Slovenian DESI country profile, 2017).

According to Eurostat, Slovenia has one of the lowest shares of high growth enterprises. Several barriers for doing business, labour regulations and government bureaucracy have a negative impact on the ability of firms to grow (2017 European Semester Country Report, p. 44).

In 2016, there was a significant increase in the share of opportunity-driven enterprises, which is a positive sign for fostering innovation activity, increasing value added and job creation. The share of established entrepreneurs (those who have been in business for more than 42 months) also raised that year after having declined for a while, suggesting favorable shift in business development and support for new micro and small enterprises. The share of necessity-driven entrepreneurs also increased further in 2016, thus exceeding for the first time the average for the EU Member States that were included in the global entrepreneurship monitor (GEM) survey. The rates of early-stage and total entrepreneurial activity also surpassed the EU average (GEM, 2017, IMAD, 2017, Rebernik et al., 2016).

2 Main R&I actors

The basic organisational scheme of Slovenian R&I system has not changed in recent years. The key actor in setting the research policy is the **Ministry of Education, Science and Sports (MESS)**. Technology development and innovation activities are in the hands of the **Ministry of Economic Development and Technology (MEDT)**. **Since being** in charge of the coordination of the Smart Specialisation Strategy, the **Government Office for Development and European Cohesion Policy (GODC)** is increasing its role in R&D policy, since all the instruments co-financed by the ESIF need

⁹ Monitoring SMEs' performance in Europe. 2017. EC.

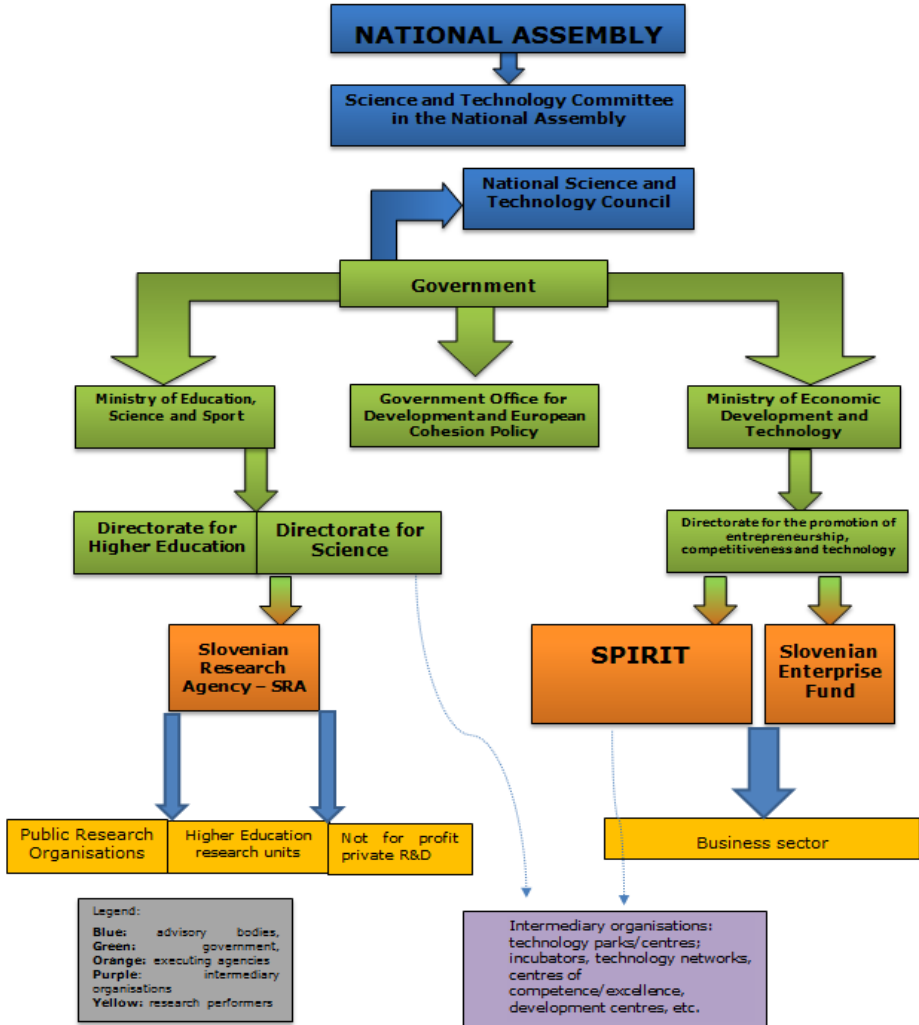
to be approved by them. The multiple actor framework makes smooth coordination imperative, and there are still issues to be solved.

At executive level, Slovenia took inspiration from the Scandinavian model of agencies and established the **Slovenian Research Agency (SRA)**, which is in charge of the distribution of public research funding according to the policies decided by the MESS and the government.

On the other hand, the Ministry of Economic Development and Technology finances partly the **Slovenian Enterprise Fund** and runs the **Public Agency for Entrepreneurship, Internationalisation, Foreign Investments and Technology (SPIRIT)**, established in 2014. SPIRIT is their executive agency for the calls directed to innovation and technology development promotion, but focuses primarily on the promotion of entrepreneurship.

MEDT also runs several programmes on its own, such as EUREKA, EUROSTARS, etc. The Ministry of Education, Science and Sports is in charge of specific programmes, aimed at research and funded by the European structural and investment funds (ESIF). Slovenian coordination of participation in H2020 and the ERA-Nets is implemented by the MESS directly.

Figure 1: Organisation structure of the Slovenian RDI system (September 2017)



The R&D&I performers in Slovenia can be divided into three groups: **universities and higher education institutions (HEIs), public research organisations (PROs) and research units within business enterprises**. The PRO sector is relatively strong and outweighs the higher education sector (HES), both in number of researchers (FTE) as in the share of public finance.

There are 16 PROs, founded by the government, which get block funding for basic R&D expenditures (around 10-30% of their total income). There are 3 public universities in Slovenia, plus 1 private and 1 international (Euro-Mediterranean University of Slovenia - EMUNI) as well as more than 60 different faculties and/or academies.

Different forms of business support institutions have been established and (co)financed over the years: from technology centres and parks, to business/university incubators, networks, clusters, technology platforms (more info at Bučar et al. 2010).

Business sector research units are increasingly important and are described in more detail in section 3.2.

The role of private non-profit R&D is minimal, both in terms of number of researchers in this sector as well as in terms of funding and performance of R&D.

The R&I system is complex and requires good coordination and policy cohesion, which is one of Slovenia's challenges.

3 R&I policies, funding trends and human resources

Main R&I policy developments in 2017

In terms of policy development, 2017 ran relatively slow. There were high expectations on the law on RDI, whose revision has been ongoing for several years now. Based on the work of a team of experts, the MESS presented an outline of the law in February 2017, putting an end to the debate on whether to integrate in the same law the basic scientific research and innovation in the light of the Resolution on Innovation Strategy of Slovenia (RISS 2011-2020: see previous RIO reports for details). Due to the institutional set-up, where innovation policy is under the responsibility of the MEDT, it was decided that MEDT should integrate innovation promotion in the legal and strategic documents under their jurisdiction, while MESS prepared the proposal for the law on R&D, focusing primarily on research activities in the public sector.

The draft law was released for public discussion at the end of October. The proposed text stirred a lot of debate, especially the proposed changes of institutional funding¹⁰ for research entities and the status of research staff. The remuneration system proposed would allow for more room to reward exceptional quality/ quantity of work, even though the research staff would remain under public employees' scheme. Also, just as academics at HEI, researchers would be allowed to work for 120% pay within their own institutions if they secure project funding in such an extent. There is a question if the government will be able to consolidate sufficiently the differences among all stakeholders to move on with the legal process, especially since Slovenia has the parliamentary elections coming in the first half of 2018.

¹⁰ Some or all of the programme funding is to be channelled into institutional funding, meaning that on the basis of evaluation of individual research entity (PRO, HEI), the money would be allocated at the level of institution and not to the individual research groups.

At the end of 2016, MESS asked for European Commission assistance through the Horizon 2020 Policy Support Facility (PSF)¹¹, intended to provide practical support to design, implement and evaluate reforms that enhance the quality of their research and innovation investments, policies and systems. The specific issues raised were internationalisation and the improvement of science- industry cooperation. The PSF expert group visited Slovenia in February and May, yet the final report with recommendations has not been delivered yet.

Draft law on R&D	MESS presented draft law on R&D in end of Oct. for public discussion till end of November ¹² . In view of numerous comments received from various science communities, the draft Law has been re-edited and submitted to other ministries for comments in end January 2018.
Action plans of Strategic Research & Innovation Partnerships (SRIPs)	Following the initial call in Dec. 2016, the nine SRIPs selected by GODC prepared their Action Plans ¹³ , which were approved by the coordination body and published in July 2017.
Policy Support Facility (PSF)	<p>The Slovenian authorities are using the PSF under Horizon 2020. The purpose is to answer the following questions:</p> <ul style="list-style-type: none"> • How should the internationalisation of the Slovenian science base be improved. • How to improve the cooperation between the science base and business. <p>A second draft was submitted to the Slovenian authorities by end of summer, yet by the end of Nov. the final report had not yet been submitted by the expert group.</p>

MESS wants to expand the support to research infrastructure in the coming years. In line with the ESFRI Roadmap and the National Programme on Research infrastructure, MESS has launched a call for expression of interest in the establishment or/and upgrading of research infrastructure for an overall amount of €14.9 million, which are expected to support 10 projects.

R&I funding trends

As seen in the table below, the funding of R&D activities (GERD) has dropped since 2013, primarily because of lower public funding. According to preliminary data, the overall funding of R&D had dropped in 2016, since the business sector investments have decreased by 6% from last year to €559 million. GBAORD for 2016 is encouraging, since it shows a halt of public funding decrease. Also, in 2016, the first calls for R&D in line with the instruments from European Structural and Investment funds (ESIF) were published, which will be increasingly important as Smart Specialisation Strategy gets implemented.

¹¹ The Horizon 2020 Policy Support Facility is a new instrument that gives Member States and countries associated to Horizon 2020.

¹² http://www.mizs.gov.si/si/zakonodaja_in_dokumenti/predlogi_predpisov/

¹³

http://www.svrk.gov.si/si/delovna_podrocja/strategija_pametne_specijalizacije/strateska_razvojno_inovacij_ska_partnerstva_srip/

Table 2: main R&D indicators

	2009	2010	2011	2012	2013	2014	2015	2016
GERD (as % of GDP)	1.82	2.06	2.42	2.57	2.58	2.37	2.2	2
GERD in national currency (Million units)	656.88	745.94	894.21	928.31	935.01	890.23	853.07	809.18
R&D funded by abroad (as % of GDP)	0.11	0.12	0.17	0.22	0.23	0.22	0.23	
R&D funded by EC (% of GDP)	0.06	0.07	0.08	0.1	0.11	0.1	0.11	

After several protests from the research community, the government announced in July that it will increase public funds for R&D in 2017 and 2018 by €18-20 million each year. Yet, even with this increase, the record figures of 2009 (€244.95 million or 0.68% of GDP) will not be matched.

Table 3: main R&D indicators – government

	2009	2010	2011	2012	2013	2014	2015	2016
GBOARD (Million units of national currency)	244.96	217.86	219.41	189.98	174.51	161.34	159.83	162.77
GBOARD (as % of GDP)	0.68	0.6	0.59	0.53	0.48	0.43	0.41	0.4
R&D funded by GOV (% of GDP)	0.65	0.73	0.76	0.74	0.69	0.52	0.44	
R&D performed by GOV (% of GDP)	0.38	0.37	0.35	0.34	0.34	0.29	0.3	0.27

In the 4th quarter of 2016 the call for the establishment of Strategic development and innovation partnerships (SRIPs) in the context of the smart specialisation strategy was launched. The nine selected SRIPs (one for each of the priorities of RIS3) prepared their Action Plans as the basis for financing. A coordination body composed of the three state secretaries¹⁴ assessed them and approved them in July 2017.

MEDT published in June a call for co-financing of research projects in business sector in line with the priorities of RIS3. The call is the same as in 2016 and addresses research projects of technology level 6-9. No parallel call was issued by MESS yet¹⁵. On the other hand, MESS put out a call to co-finance technology transfer offices (TTO) in June 2017. From 2017 to 2022, €6 million will be made available to support the activities of TTO.

3.1 Public allocation of R&D and R&D expenditure

The government's R&D budget for 2016¹⁶ shows a small increase (GBOARD) and the Ministry for Education, Science and Sport claims that the financing trend will be gradually reversed. The Ministry is also aware that the public finance is still in a crunch, so reaching past levels of GBOARD will take some time. This is felt both in PROs as in HEIs, especially since the government is financing more than 70% of the R&D performed by PRO and 66% of R&D activities of HEI. Still, the planned figures for 2017 are encouraging, if implemented.

¹⁴ State secretary of GODC, MEDT and MESS.

¹⁵ In 2016, there was a joint call, with MESS focusing on public research units and MEDT on business entities, and co-financed by ERDF (see details in 2016 RIO Report on Slovenia, 2017).

¹⁶ Ministry of Finance data on approved budgets for 2016 and 2017: http://www.mf.gov.si/si/delovna_podrocja/proracun/sprejeti_proracun/

As mentioned, SRA¹⁷ is the main organisation for funding of public research entities with the distribution of grants to selected research programmes/ projects and other activities. Each of the regular programmes has its selection and evaluation system pre-specified¹⁸. The SRA's planned annual budget experienced significant cuts over the last years: while in 2010 its budget was 184.8 million EUR, it was cut to 133.1 million EUR in 2015 and slightly increased in 2016 to 144.6 million EUR (SRA, 2017a).

Table 4: Main indicators R&D- academia

	2009	2010	2011	2012	2013	2014	2015	2016
R&D performed by HES (% of GDP)	0.26	0.29	0.29	0.29	0.27	0.25	0.22	0.22
R&D performed by HES and funded by public (GOV) (% of GDP)	0.21	0.22	0.21	0.2	0.18	0.16	0.15	
R&D performed by HES and funded by private (BES and PNP) (% of GDP)	0.02	0.03	0.04	0.03	0.03	0.03	0.03	
Number of international scientific co-publications per million population	660.32	714.22	835.04	940.89	988.43	990.26	1076.2	1128.3
Percentage of scientific publications among the top 10% most cited publications worldwide as % of total scientific publications of the country		7.98	7.3	8.75	7.57	8.29		
Research excellence composite indicator (Rank)	18	20	20	20	20	20		
ERC success rate (granted over evaluated)			0.03					

The decline in the SRA budget was felt differently by each of the financing instruments. In 2012, SRA had a budget of €154.5m and distributed the funding so as to allocate 34% to research programmes, 21% to research projects (both basic and applied) and 19.2% to young researchers' programme. By 2016, total SRA funding was €144m, with 39.9% going to research programmes, 24.5 to research infrastructure, 21.1% to research projects and 12% to young researchers programme. The latter suffered the biggest cut, which can be observed also in a number of new young researchers annually: from 250 in the past, only 177 new young researchers were approved for financing in 2017(SRA, 2017b).

The technology and innovation support is coordinated by the Ministry of Economic Development and Technology, primarily through SPIRIT and the Slovenian Entrepreneurship Fund (SEF). With the adoption of RIS3, the structural funds have been released to co-finance the measures planned in Operational Programme 2014-2020¹⁹. The most important among these measures is the support of €74m till 2022 provided to enterprises for the implementation of their R&R projects, with specific focus on technology level 6-9.

Other measures include grants for internationalisation, "Seal of Excellence" support, grants to innovation support organisations, as well as standard programme of

¹⁷ <http://www.arrs.si>

¹⁸ The SRA's programme consists of:

- long-term financing of research programmes, known as "Research programme groups" (three to six years contracts, awarded to a group of researchers for their programme of basic research),
- basic and applied research projects' funding,
- targeted research projects
- young researchers programme,
- support to the research infrastructure,
- institutional funding of the public research institutes, established by the government
- financing of the participation of Slovenian researchers in international research networks and organisations
- co-financing of international research conferences and other events,
- international and bilateral R&D cooperation, etc.

¹⁹ See RIO Report 2016 for details.

instruments of SEF (start-ups, technological restructuring grants, guarantees). The R&D tax subsidies' policy has not changed in 2017 and remains an important instrument of promotion of R&D investment by business sector (see details in 3.2).

3.2 Private R&D expenditure

The business sector's share in total R&D expenditure has declined in nominal terms, but remained high at 69% of the total GERD in 2016 and is as such significantly higher than in the EU. The share of researchers in the business sector, at 55% in 2016, is also considerably above the EU average (2015: 48.7%). In 2009–2015 the business sector increased R&D investment by 42.2% in real terms, partly as a result of the funding from the European Commission under H2020 (where co-funding by enterprises was required) and structural funds' co-financing of the centres of excellence and competence and development centres in 2010–2013 (IMAD, 2017). In relation to GDP however, BERD stalled in 2013 at the level of previous year and decreased in 2014 (1.84% of GDP), again in 2015 (1.69% of GDP) and even more dramatically in 2016 (1.51%).

Throughout the period, R&D financing was favourably affected by an R&D tax relief. In 2009–2015 Companies in the pharmaceutical industry claimed one-third of the total amount, manufacturers of motor vehicles and of electrical equipment claimed one tenth each, and one-fifth was claimed by various service activities, primarily knowledge-intensive services (IMAD, 2017). These are also the most R&D intensive sectors.

The share of the government sector's R&D expenditure allocated for financing research in the business sector has declined significantly in recent years: in 2016, only 3% of research activity in business sector was financed by the government. Meanwhile, the business sector allocated less than 3% of its total R&D expenditure for financing research undertaken by the public sector (HEI and PRO), but in their budgets this covered 8.4% of their R&D activity. The small share of R&D cross-financing is hindering cooperation between sectors and the transfer of R&D results, which is vital to reach synergies and increase the efficiency of R&D investment (IMAD, 2017).

Surveys among foreign investors demonstrated an R&D and export intensity above average when compared to the total corporate sector over the last decade (2,23% compared to 1,69% in total corporate sector²⁰), but also high variation in R&D expenditures and the size of R&D departments among foreign affiliates (Survey SPIRIT Slovenija, 2016).

The 2016 SPIRIT survey revealed that 51% of foreign affiliates do not invest in R&D, about 13% of sample firms invest less than 1% of revenues, 6% of sample firms invest between 1-2% of revenues. Almost 4% of foreign affiliates invest 2-3% of sales revenues into R&D, 6% of sample firms invest 4-5%, while almost 7% invest between 7-10% of revenues. Some foreign affiliates are highly R&D intensive; 2,5% of foreign affiliates invest between 20-40% of revenues into R&D, while 2% of foreign affiliates invest over 50% of their revenues (Jaklič et al., 2016, 2017).

A quarter of foreign affiliates has their own R&D departments. Their size ranges from 1 employee to 267 employees, most frequently 5-10 employees, while 7% of foreign affiliates have over 50 employees in R&D department. A survey demonstrated also rising dynamics of international assignments in R&D and knowledge intensive activities, with Slovenian foreign affiliates being net exporters of experts (assignees) for the second consecutive year (Jaklič et al., 2016, 2017).

²⁰ According to the 2012-2014 CIS survey; see <http://www.stat.si/StatWeb/en/Field/Index/18>

3.3 Supply of R&I human resources

Given the long-term trend of high participation of young people in tertiary education, the share of tertiary graduates has been rising for a number of years, albeit at a slower pace in 2016, which is explained by demographic issues. According to the IMAD 2017 Development Report (IMAD, 2017), the share of women with tertiary education is higher than men's.

STEM studies continue to be promoted through more favourable scholarship policies and there has been a small increase in the share of students enrolled. Also, the women's share has improved. SORS (2017) data show that in 2004 only 7% of women were enrolled in S&T tertiary education; in 2010 the number grew to 11% and in 2016/17 14.3% of women chose STEM (SORS, 2017c).

The R&D sector employed 14 357 people (in full time equivalent) in 2016 (provisional data). Of these, 8 102 are classified as researchers (Eurostat, 2017). The decline of 782 FTEs from the peak in 2012 appears to be linked to the reductions in public funding of R&D in recent years. Much of this reduction was felt in the age group 25-34, where employment in 2015 is only at 83% of what was in 2012 (SORS, 2017d).

There are media reports on the outflow of highly educated youth, but little systematic statistical data exist to support this. However, in view of the decrease in public R&D funding especially for post-doctoral and project research, this trend can be anticipated.

In terms of labour market mismatch, Slovenia finds itself in an interesting position: the employers complain they cannot find labour for the simple labour-intensive manufacturing and construction jobs. The insufficient technological restructuring of Slovenian industry might be one of the explaining factors. This explains also the problems in science-industry cooperation. Such mismatch between demand and supply of labour is not so explicit for highly skilled labour, except in the ICT sector.

4 Policies to address innovation challenges

4.1 Challenge 1: Ensure the sustainability of R&D&I funding

Description

Slovenia's total R&D expenditure rapidly increased in the period 2008-2012 both in nominal values (up to €928.3m in 2012) and as percentage of GDP (2.58% that same year). The contribution of the business sector was essential here, since their investment grew in real terms by 47.4%. However, GERD stalled in 2013 at the level of the previous year and decreased in 2014 (€890m or 2.39% of GDP), in 2015 (€853m or 2.21% of GDP) as well as in 2016 (€809m or 0.20% of GDP). In 2016 Slovenia moved further away from its R&D intensity target.

The Research and Innovation Strategy of Slovenia (RISS), which is the key policy document in the field of R&I, planned a constant increase in the resources for R&D, following the EU objective of 3% of GDP invested in R&D with the allocation of public money (1%) and business sector's investment (2%). While the business sector not only achieved, but even surpassed this target, the public allocation decreased from 0.68% of GDP in 2009 to 0.40% of GDP in 2016.²¹ This trend was partly the result of savings needed due to the budget deficit but also partly due to the gap in the implementation of the programmes, co-financed by EU funds (ESIF)²². This created significant drop in financing of public research organisations (both HEIs and PROs).

Policy response

A small increase in the allocation of public resources was implemented in 2016 (€2.9 million), with additional 18-20 million a year planned for 2017 and 2018 (MESS, 2017). The ministry would like to introduce a mandatory clause in the new Law on R&D, where the increase of funds will be planned in consequent budgets, depending on the speed of overall economic growth. Yet the envisaged dynamics would require several years to reach again the figures of GBOARD obtained in previous years.

Assessment

Fiscal consolidation remains a key government priority, at least in the short run²³, so very few savings measures introduced during the financial/ economic crisis have been eliminated. At best, small increases of different public expenditures are allowed for²⁴. It seems that investment in the science and technology area is not sufficiently seen as strategically important for sustainable economic growth in the long-term, since the NRP 2017-2018 does not address this issue at all.

²¹ Even though a minimal nominal increase in GBAORD was recorded in 2016 (€2.9m), with the GDP growth the share of GBOARD declined from 0.41 in 2015 to 0.40 in 2016.

²² The 2007-2013 financial perspectives ended, while the 2014- 2020 programming period could not start due to the delays caused by the non-acceptance of the operational programme and the smart specialisation strategy.

²³ The National Reform Programme 2017-18 states that the following are the main objectives: Long-term structural measures to provide sustainable public finance; Measures with a short-term structural effect; Measures to enhance growth potential (NRF, 2017: <https://ec.europa.eu/info/sites/info/files/2017-european-semester-national-reform-programme-slovenia-en.pdf>).

²⁴ For example, in the public sector, regular promotions are allowed again, after a freeze of several years.

4.2 Challenge 2: Development of a well co-ordinated and transparent R&I governance

Description

Putting in place a modern, transparent, well co-ordinated and comprehensive national innovation system has been a challenge for Slovenia for a number of years. This was precisely one of the essential tasks of the Research and Innovation Strategy (RISS) adopted in 2011, which aimed at ensuring better policy coordination and therefore a more effective R&D&I system. Yet, according to the implementation report, only 10 of the 69 measures planned have been implemented so far, 41 are in the implementation process, and 18 have not been started (RISS implementation report, 2016).

The policy coordination problems and the so-called "implementation deficit" date back to the reorganisation of the R&D&I sector and the system still needs to adapt to the split of the technology and innovation sections in 2 different Ministries. As it can be observed in various strategic documents²⁵, innovation and technology gradually became a sub-item in documents dealing with entrepreneurship promotion. On top, the Technology Agency, which was to become SRA's homologue, was integrated in SPIRIT and most of its instruments phased out²⁶.

The lack of a coordinated approach has also been demonstrated in the preparation of the Law on RDI. Initially this was to be joint a text, regulating both the research and innovation activity in a coordinated and a coherent manner. After years of discussions on how to design the law, at the beginning of 2017 MESS decided to prepare a law, addressing the research segment only.

The 2017 European Semester Country Report for Slovenia has also acknowledged (p. 42) that Slovenia lacks an effective governance structure for R&I in view of weak coordination across responsible departments and collaborative links between major stakeholders in innovation policy.

Policy response

The implementation section of the Smart Specialisation Strategy (2015) provides for a new coordinating body called the Implementation Working Group. It comprises representatives of all three main R&D&I policy actors, namely State Secretaries of GODC, MEDT and MESS. A special unit within GODC supports the working group, and prepares all necessary documentation and analyses (see details in the smart specialisation section).

Assessment

At the time of the Research and Innovation Strategy design, it seemed that Slovenian authorities considered science and technological development as the path to increase productivity, improve the competitiveness of Slovenian economy and contribute positively to the development of society (Bučar and Stare, 2014). The attitude towards and the status of S&T in government policies reflects a change of priorities: cutting the budget deficit, stimulating economic growth (but not necessarily based on elements of knowledge economy) and maintaining balanced relationships within the public sector

²⁵ Programme of the Implementation of Financial Support of MEDT 2015-2020 (MGRT 2016), Partnership Agreement between Slovenia and European Commission for the period 2014-2020, National Reform Programme 2016-2017, April 2016. Gov. of Slovenia.

²⁶ More details in the RIO Country Report 2015.

(National Reform Programme 2017-2018). Small increases of public finance for R&D are reflection of this.

4.3 Challenge 3: Human resources in S&T

Description

Slovenia managed to increase the enrolment of youth in tertiary education significantly. With special measures to promote doctoral studies (Young researchers, young researchers from business sector, Innovative funding scheme for doctoral students), the number of students engaged in these studies had increased in previous years too. At peak years the programme for young researchers allowed on a regular basis for annual new enrolments of more than 220 new candidates (in 2009 even 252), which helped to rejuvenate public research sector.

The increase in funding of public research (2009-2013) made it possible to hire young people to HEIs and PROs. Yet, with the reversal of this trend- which happened at the time when many Ph.D.s were completing the above mentioned programmes- Slovenia experienced a much larger outflow of PhDs, both in SMET as in other fields, than the research sector was able to absorb. This led to increased unemployment of the most qualified labour, with some leaving to find jobs abroad and others accepting work below their qualifications level. Limited return possibilities further limit the potential gains from brain drain.

Policy response

A special call to stimulate employment of researchers at the beginning of their career was published in September 2016 by MESS. The instrument finances research projects where employment of researchers at the beginning of their careers will be stimulated. Their research work should promote the cooperation between the PROs and enterprises, yet not necessarily directly beneficial to a single enterprise. During the time of the implementation of the project, the researcher needs to spend minimum one fourth of the project time in the company. In the selection process, a special attention was given to the Slovenian young researchers abroad to stimulate their return. The priority areas for the projects should be aligned with RIS3 priorities. The total value of the call was €10m for the period 2017-2020, since majority of the funding is from ESIF (MESS, 2016). 37 projects were selected for funding in total value of €5.4 million (MESS, 2017)²⁷.

An SRA call, issued in 2016 for basic and applied projects awarded financing to 62 projects to young doctors and post-doctoral candidates in 2017. But the amount of resources, dedicated to the funding of such projects, has increased only modestly: the budget for post -doctoral projects increased from €1.9 million in 2015 to €2.2 million in 2016. According to publicly available documents, no measure similar to young researchers from industry or other measure to promote employment of Ph.Ds. in business sector is planned.

Assessment

Considering there were 742 new Ph.Ds²⁸ in 2015 and in 2016 as many as 912 Ph.Ds, employment possibilities in the R&D field still appear to be insufficient. Employment opportunities are not even enough for all of those who are supported by the Young

²⁷

http://www.mizs.gov.si/fileadmin/mizs.gov.si/pageuploads/Znanost/doc/Strukturni_Skladi/Raziskovalci_na_zac_etku_kariere/Priloga_1_REZULTATI_JAVNEGA_RAZPISA_cistopis.pdf

Researchers' programme. The analysis of SRA (2016) shows that the unemployment of young researchers reached the peak in 2015 with 23.5% of those who have completed the training. This figure includes only those who have registered at the Agency for employment, which means that those who found employment abroad are not included.

5 Focus on R&I in National and Regional Smart Specialisation Strategies

Slovenia adopted its Smart Specialisation Strategy (RIS3) in 2015.²⁹ Goals include:

1. Increasing the value added per employee
2. Improving Slovenian competitiveness on global markets with an increased share of knowledge and technology in exports³⁰ and
3. Increasing the overall entrepreneurial activity (from current 11 % to the EU average of 12.8%).

RIS3 identifies three priority areas and the areas of application pursued as a priority by Slovenia's development policy and the stakeholders. The smart specialisation strategy (RIS3) has been built on the process of entrepreneurial discovery with considerable involvement of business sector. Selected priority areas correspond with the industries most active in R&D&I.

At the same time, RIS3 tries to develop a supportive business-innovation ecosystem, which aims to be horizontal, and whose performance aims to affect the competitiveness of priority areas (e.g. in promoting the establishment of new enterprises, spurring their development, introducing lean innovation, supporting the introduction of design thinking, promoting joint discussion on the long-term development of markets and the role of consumers within).

The 3 priority pillars (a) Digital, b) Circular and c. (S)Industry 4.0) have nine areas of application (i. Smart cities and communities, ii. Smart buildings and homes, including wood chain, iii. Networks for transition into circular economy, iv. Sustainable food production, v. Sustainable tourism, vi. Factories of the future; vii. Health-medicine; viii. Mobility; ix. Development of materials as products). The nine areas of application are narrowed down to focus areas and technologies or even more specifically, the areas of joint development (see RIO Report 2016 on RIS3 priorities and corresponding focus areas and technologies). The Smart Specialisation Strategy aims at enhancing synergies in R&I and is expected to improve access to finance and reduce the administrative burden of SMEs. This will help support approximately 8 500 SMEs with the goal of boosting growth and jobs (2017 European Semester country report).

New policy developments

- RIS3 became recognised as development priority that needs to be harmonised with other policies. With the adoption of RIS3, the structural funds have been released to co-finance the measures planned in Operational Programme 2014-2020. Efforts are seen mainly in policy implementation and capacity building in order to monitor the effect of SRIP development (GODC, 2015) and an evaluation methodology for RIS3.

²⁹ The government adopted smart specialisation strategy of Slovenia on 20th September 2015 and approved by the European Commission in the first week of November 2015 (RIO Slovenia Country Report, 2016).

³⁰ Increasing the share of high-tech-intensive products in exports from 22.3 % to the EU-15 average of 26.5 %; and the share of export of knowledge-intensive services in total exports from 21.4 % to 33 %, which means cutting in half the lag behind the EU average.

Besides RIS3, the methodology and identification of new priority areas for the new financial perspective is being examined (within the targeted research projects financed by the MEDT).

Progress on implementation

Delays in the preparation of the RIS3 strategic documents have also resulted into a delay in implementation (see also section 3.1). GODC managed to centralise the approval of RIS3-related financial support. Over the period 2016 – 2018, Slovenia plans to invest €1.9b through the Operational Programme in accordance with the thematic priorities of the Smart specialisation strategy (RIS3) (€1b on R&D&I, €0.8b on entrepreneurship and €0.05b on human resources). All the programmes in the field of R&D require co-funding from the beneficiary and will therefore also trigger private investment. Several calls that support implementation of RIS3 were launched in 2016 (See details in RIO Report 2016) and 2017.

2016 calls

The Slovene Enterprise Fund (SEF) launched a call for Incentives for establishing innovative enterprises in May 2016 (P2 2016 in total amount 2.600 EUR) and in June 2016 (P2B 2016) in total amount of 1.680.000 EUR. In April 2016 SEF launched a call for promoting new innovative enterprises through seeds capita in total amount of 1 million EUR (max 200.000 per enterprise). A call for incentives for establishing innovative enterprises was repeated in March 2017 (P2 2017) in total amount 2.16 million EU (see below).

The MEDT prepared a Programme for the Implementation of Financial Support of MEDT 2015-2020, where one of the important tasks is "the establishment of complex and integrated entrepreneurial and innovation support environment for potential entrepreneurs and firms at all stages of growth and development." (MEDT, June 2016). The services are to be provided through a restructured and modernised VEM (*Vse na enem mestu*; one stop shop) points. Together with other "subjects of support environment"³¹, they will provide support to innovative start-ups, process improvements, internationalisation, etc. The Ministry estimates that this type of support will require €62.4m until 2020.

In October 2016 the MEDT launched a call for supporting SRIPs at priority areas of Smart specialisation strategy (RIS4). The total amount was 10.490.783,75 EUR (out of it 810.000 EUR for the first stage, 4.840.000 EUR for the second stage and at least 4.840.783,75 EUR for the third stage).

In the area of entrepreneurial support, SPIRIT issued in June 2016 a public call for the registration as a "subject of support environment" (SPIRIT 2016a). If a specific organisation (Technology Park, incubator, development centre, etc.) fulfils the criteria, they can be registered in the MEDT/SPIRIT evidence of support institutions. Once registered³², the institutions will be able to apply for the financial support. SPIRIT plans €2m for the support institutions, with €459,000 coming from the MEDT budget and the remaining from the structural funds (SPIRIT, 2016b, p. 24).

In October 2016 the SPIRIT also launched a call for promoting process improvement within enterprises in 2016 and 2017 – Process Voucher 2016 and 2017 in total amount 3 million EUR. Next, also in October 2016, the Spirit launched a call for providing

³¹ Defined as technology parks, incubators, co-working spaces.

³² The call was opened till end of September 2016.

supporting services to the entities of the innovative ecosystem in 2016 and 2017 (SIO 2016-2017) in total amount of 3,200,000 EUR. In December 2016 the SPIRIT launched a call for strengthening innovative competencies within enterprises in total amount of 8,000,000 million.

At the end of October 2016 the Slovene Human Resources and Scholarship Fund launched a call for competitive centres for human development in 2017 and 2018 that closed in December 2016³³. The call aimed to improve competences, productivity, creativity of employees and thus enhance the competitiveness of Slovenian economy. The total amount of €3.9 is spread over 11 competence centers (selected out of 32 submissions) ranging from €250.000 to €400.000 per each partnership. Approved projects include 240 enterprises (ranging from micro to large enterprises) with over 35,888 employees. The selected projects plan over 25,000 trainings in the 2017-2018 period (out of it almost 5,900 internal trainings) enabling knowledge transfer between enterprises.³⁴

2017 calls

In April 2017 the MEDT launched a special call for co-financing Competence centers for development of human resources and new processes in the area of design management (KCDM 2.0) for the period 2017-2019 in total amount of €900 000.

In June 2017, the MESS launched a call for promoting knowledge transfer through Technology Transfer Offices (TTO) in total amount of €6 million.

The Strategic Research & Innovation Partnerships (SRIP) promote long-term collaboration in all relevant areas. These partnerships (in detail in RIO Report 2016) are in many cases not newly established structures but enhanced existing structures in new, mostly larger networks. Still, the level of joint activities planned is significantly higher than the cooperation so far and many new joint activities and platforms are planned.

A partnership was established for each of the nine areas by the end of 2016. Coordinators of SRIPs (=clusters) were also agreed. More than 500 stakeholders joined the initiative, which is open and other actors can therefore join in the future. This is particularly important for small and medium-sized enterprises (SMEs). The cooperation between stakeholders in SRIPs will build on: **coordination** of R&D activities, **sharing** research capacities and human resources, **exchange** of knowledge and experience, **networking** and collective **representation** of interest abroad.

By April 2017, each SRIP was called to develop roadmap as a part of the action plan. After SRIPs edited them and incorporated the received comments, the Action plans were approved by the SRIPs and adopted by the Government (GODCP) by July 2017 and the implementation has started. Based on the yearly action plans the stakeholders' events of the SRIPs were launched in September 2017 and are planned to continue throughout the RIS3 implementation period in 2018-19.

Stakeholders collaboration:

The Chamber of Commerce and Industry of Slovenia has announced the provision of an in-depth description of services supporting efficient and uniform work of SRIPs – including well-established information communication tools for efficient work with consortia – in collaboration with the ICT horizontal network under the Smart Cities and

³³ <http://www.sklad-kadri.si/si/razpisi-in-objave/razpisi/n/jr-koc/>

³⁴ The list of selected competence centres is available here: http://www.sklad-kadri.si/fileadmin/dokumenti/1_Razvoj_kadrov/KOC_2.0/Objava_rezultatov_KOC_2017-2018.pdf

Communities SRIP. The launch of the first initiatives by SRIPs is planned for September 2017.

In March 2017 the Slovene Enterprise Fund launched a call for establishment and growth of new innovative enterprises (2,16 Mio EUR total and 400.000 EUR only in 2017), focused on commercialisation of innovation. The programme aims at supporting up to 40 new start-up every year in the 2017-2019 period. Also, the SEF continued with its standard annual calls for its products (guarantees, support to technology upgrading

The Ministry of Economic Development and Technology (MEDT) launched a call for co-financing of business research and development projects in global value chains and international networks (with focus on technology level 6-9- TRL6-9) in June 2017 within the RIS3 priorities (total available sum for three years is €74 million, partially financed by *ERDF*). With the adoption of RIS3, the structural funds have been released to co-finance the measures planned in Operational Programme 2014-2020. The deadline for application is the end of September 2017 and financing will start in 2018. The enterprise can receive a grant of maximum €500.000 to co-finance 25% to 45% of the costs of R&D project. No results of the call have been published so far.

A call for supporting incentives under the EUREKA initiative was also launched by MEDT in June 2017.

Other calls and incentives in 2017 are spread over several areas. In September, SPIRIT issued the call for promoting and co-financing R&D investment among SMEs that were eligible for »Seal of Excellence« in the second stage of Horizon 2020 framework. In October, the MEDT launched a call for process innovation in the total amount of €1.5 million. Regular calls related to internationalisation (promotion joint and individual presentations at fair) and instruments for innovative environment are planned to be issued by the end of 2017.

Monitoring mechanisms and the feedback loop

The GODC team is monitoring the alignment of all of the calls in R&D&I field with RIS3, which in practice means that no call can be published without their approval.

GODC used the possibility of commissioning an external team to develop a monitoring methodology for the functioning of SRIPs.

Evidence of impact

Due to significant delay in the preparation of RIS3, it is yet impossible to know RIS3's impact. Since most of the measures, envisaged under RIS3 have only been approved in late 2016 or are still in the process, mostly only indirect impacts can be observed at this stage. Nevertheless, by autumn 2017, all the governance structures of the SRIPs as well as the processes of the preparation of individual calls were put in place.

An analysis of the calls launched and resources under Thematic Objective 1 (TO1) of national and regional Operational Programmes for the European Regional Development Fund (ERDF)³⁵ shows that until December 2016 seven calls have been launched in Slovenia to operations falling within the selected RIS3 research and innovation priorities, with an overall expenditure of 94,040,784 M€. The ERDF TO1 allocation by typology of policy instrument shows that the support to R&TDI projects was the most prominent policy instrument in Slovenia (77%), followed by Innovation Support Services (11%),

³⁵ Gianelle, C., Guzzo, F. and Mieszkowski, K. (2017) Smart Specialisation at work: Analysis of the calls launched under ERDF Operational Programmes, JRC Technical Reports JRC106974.

Support to business support organisations, innovation networks and platforms (11%) and Support to innovative SMEs creation and strengthening (1%).

Slovenia has been an active country in building RIS3 interregional collaborations in the framework of the S3P Industrial Modernisation³⁶ and S3P Energy³⁷ Thematic Platforms. In this sense, it is one of the leading countries of the two Industrial Modernisation S3 partnerships: "Digitalisation and Safety for Tourism" and "SME integration to Industry 4.0". It has also shown interest in the partnership on "Efficient and Sustainable Manufacturing" and has actively approached some additional partnerships that have stemmed out of the pilot actions of the Vanguard Initiative. Furthermore, by late 2017 it has been actively involved as a partner country in four of 5 S3 partnerships on energy "Smart Grids", "Solar Energy", "Sustainable Buildings" and "Bioenergy". The overall aim of these partnerships is to support the creation of value chains in interregional collaboration within the key S3 priority areas selected by regions, to generate a pipeline of investment projects.

At the Vanguard Initiative Annual Political Meeting on 22 November 2017 in Brussels, Slovenia has, along with four EU regions from IT, AT and SE, officially joined the Vanguard regions, which aim to lead pioneer industrial innovation investments in the EU in the coming years.

The overall evaluation of the implementation of RIS3 is planned in 2018, both by an in-house team as well as externally.

³⁶ <http://s3platform.jrc.ec.europa.eu/industrial-modernisation>

³⁷ <http://s3platform.jrc.ec.europa.eu/s3p-energy>

References

- Bank of Slovenia (2017) Macroeconomic projections for Slovenia, June, 2017
- BS (2016). Direct Investment 2015. Bank of Slovenia, Ljubljana, October, 2016.
- Bučar, M, González Verdesoto, E; *RIO Country Report 2016: Slovenia*; EUR 28491 EN
- BUČAR, Maja, JAKLIČ, Andreja, UDOVIČ, Boštjan (2010) *National system of innovation in Slovenia*, (Analyze CMO, 4). Ljubljana: Faculty of Social Sciences, Založba FDV, 2010. ISBN 978-961-235-407-7. <http://www.mednarodni-odnosi.si/cmopublications.htm>.
- BUČAR, Maja and STARE, Metka (2014) Evolution of innovation policy in Slovenia since 2004 – promises and pitfalls. *Studia Historica Slovenica* 14 (1): 177–196.
- EC (2017a) European Commission's autumn economic forecast. Autumn 2017 Economic Forecast – Slovenia. https://ec.europa.eu/info/business-economy-euro/economic-performance-and-forecasts/economic-forecasts/autumn-2017-economic-forecast_en
- EC (2017b) European Semester: Assessment of progress on structural reforms, prevention and correction of macroeconomic imbalances, and results of in-depth reviews under Regulation (EU) No 1176/2011. Country Report Slovenia 2017. Brussels, 22.2.2017 SWD(2017) 89 final.
- EC(2017c) Country Report Slovenia 2017; Commission's Staff Working Document: {COM(2017) 90 final} {SWD(2017) 67 final to SWD(2017) 93 final}; https://ec.europa.eu/info/files/2017-european-semester-country-report-slovenia_en
- GEM (2017) GEM - Global Entrepreneurship Monitor: 2016/17 Global Report. Babson College, Universidad del Desarrollo, Universiti Tun Abdul Razak and Tecnológico de Monterrey. <http://www.gemconsortium.org/>.
- GII, (2017) The Global Innovation Index in 2017. Innovation feeding the growth. <https://www.globalinnovationindex.org/gii-2017-report>
- GODC, 2015 Strateška razvojno inovacijska partnerstva (Strategic development innovation partnerships) http://www.svrk.gov.si/fileadmin/svrk.gov.si/pageuploads/KP_2014-2020/Strategija_pametne_spezializacije/2015_11_10_SRIP_splet.pdf
- IEF (2017). The 2017 index of economic freedom. The Heritage Foundation. <http://www.heritage.org/index/country/slovenia>
- IMAD (2017) Development Report 2017. Institute for Macroeconomic Analyses and Development. http://www.umar.gov.si/en/publications/development-report/publication/news/porocilo-o-razvoju-2017-1/?tx_news_pi1%5Bcontroller%5D=News&tx_news_pi1%5Baction%5D=detail&cHash=82b885320ab88071c0e23f9089408635
- Kunčič, Aljaž, (2012). Institucije in razvoj formalnega institucionalnega okolja v Sloveniji. IB revija. Vol.46, no.1, pp 5-19.
- Jaklič, Andreja, Koleča, Iris and Rojec, Matija (2016). Tuji investitorji o slovenskem poslovnem okolju 2016. (Foreign investors about Slovenian business environment 2016) Survey SPIRIT Slovenija, 2016. Fakulteta za družbene vede, Ljubljana, 2016.

Jaklič, Andreja, Koleša, Iris and Rojec, Matija (2017). Tuji investitorji o slovenskem poslovnem okolju 2017. (Foreign investors about Slovenian business environment 2017) Survey SPIRIT Slovenija, 2017. Fakulteta za družbene vede, Ljubljana, 2017.

MESS (2017) Izhodišča nove zakonodaje – ZRRD in ZViS (Key elements of new legislation- Law on R&D and Law on Higher Education); mimeo.

Ministry of Finance (2017) Sprejeti proračun za 2017 (Adopted budget for 2017); available at: http://www.mf.gov.si/si/delovna_podrocja/proracun/sprejeti_proracun/spremembe_proracuna_rs_za_leto_2017/

NRP (2017) National Reform Programme 2017-2018; Gov. of Rep. of Slovenia; April 2017; <https://ec.europa.eu/info/sites/info/files/2017-european-semester-national-reform-programme-slovenia-en.pdf>

Rebernik, M., et al., (2016). Podjetništvo med priložnostjo in nujno: GEM Slovenija 2015. Maribor: Univerza v Mariboru, Ekonomsko-poslovna fakulteta.

RISS Implementation Report (2016) Poročilo o uresničevanju Resolucije o raziskovalni in inovacijski strategiji Slovenije 2011-2020. Ministry of Education, Science and Sports and Ministry of Economic Development and Technology.

Slovenian DESI country profile (2017). Europe's Digital Progress Report 2017.][Digital Economy and Society Index 2017 – Slovenia - Europa EU](https://ec.europa.eu/digital-single-market/en/scoreboard/slovenia). <https://ec.europa.eu/digital-single-market/en/scoreboard/slovenia>

SORS (2017a) Release on GDP, 30/11/2017. <http://www.stat.si/StatWeb/en/Field/Index/1>

[SORS \(2017b\) http://www.stat.si/StatWeb/News/Index/6879](http://www.stat.si/StatWeb/News/Index/6879)

SORS (2017c) <http://www.stat.si/StatWeb/en/Field/Index/9/111>

SORS (2017d) <http://www.stat.si/StatWeb/en/Field/Index/25/18>

SRA (2016) Več kot 30 let mladih raziskovalcev (More than 30 years of Young Researchers), http://www.arrs.gov.si/sl/analize/publ/inc/ARRS_MR30_zbornik.pdf

SRA (2017b) Facts and Figures: Facts and Figures: Young Researchers; <http://www.arrs.gov.si/en/analize/obseg01/mr.asp>

SRA(2017a) Annual Report 2016; <http://www.arrs.gov.si/en/gradivo/dokum/inc/ARRS-Annual-Report-2016.pdf>

WB doing business, 2018. The World Bank. <http://www.doingbusiness.org/rankings>

WEF GCI, 2017. The Global Competitiveness Report 2016-2017. World Economic Forum. Geneva 2016.

Abbreviations

CIS	Community Innovation Survey
EC	European Commission
ECFIN	European Commission's Directorate General for Economic and Financial Affairs
ESIF	European structural and investment funds
EU	European Union
EU28	European Union's 28 Member States
FTE	Full time equivalent
GBARD	Government budget appropriations for research and development
GDP	Gross domestic product
GERD	Gross domestic expenditure on R&D
GODC	Government Office for Development and European Cohesion Policy
HEI	Higher education institutions
HES	Higher education sector
IMAD	Institute for Macroeconomic Analyses and Development (Slovenia)
IMF	International Monetary Fund
MEDT	Ministry of Economic Development and Technology
MESS	Ministry of Education, Science and Sports
MPA	Ministry of Public Administration
OECD	Organisation for Economic Co-operation and Development
PNP	Private non profit
PRO	Public research organisation
R&D	Research and development
R&D&I	Research, development and innovation
RIS3	Smart specialisation strategy of Slovenia
RISS	Research and Innovation Strategy of Slovenia
SORS	Statistical Office of the Republic of Slovenia
SPIRIT	Slovenia's Public Agency for Entrepreneurship, Internationalisation, Foreign Investments and Technology
SRA	Slovenian Research Agency
TRL	Technology readiness levels

Factsheet

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
GDP per capita (euro per capita)	17700	17700	18000	17500	17600	18200	18800	19600		
Value added of services as share of the total value added (% of total)	66.72	67.41	66.79	66.26	65.96	64.85	65.09	65.52		
Value added of manufacturing as share of the total value added (%)	19.56	20.16	20.96	21.6	22.22	22.88	23.08	23.24		
Employment in manufacturing as share of total employment (%)	21.21	20.34	20.61	20.48	20.28	20.25	20.28	20.48		
Employment in services as share of total employment (%)	59.08	60.56	61.18	61.74	62.26	62.55	62.8	63.22		
Share of Foreign controlled enterprises in the total nb of enterprises (%)	1.94	1.95	3.73	4.14	4.53	5.09	5.35			
Labour productivity (Index, 2010=100)	96.8	100	103.4	102.7	101.6	103.1	103.7	106.3		
New doctorate graduates (ISCED 6) per 1000 population aged 25-34	1.09	1.07	1.2	1.23	2.69	2.02	2.02			
Summary Innovation Index (rank)	12	12	12	12	12	12	12	12		
Innovative enterprises as a share of total number of enterprises (CIS data) (%)				46.5		45.9				
Innovation output indicator (Rank, Intra-EU Comparison)			16	15	17	18				
Turnover from innovation as % of total turnover (Eurostat)		10.6		10.5						
Country position in Doing Business (Ease of doing business index WB)(1=most business-friendly regulations)						35	29	30	30	37
Ease of getting credit (WB GII) (Rank)						102	101	104		
EC Digital Economy & Society Index (DESI) (Rank)						17	18	18	17	
E-Government Development Index Rank		29		25		41		21		
Online availability of public services - Percentage of individuals having interactions with public authorities via Internet (last 12 months)	35	44	46	48	52	53	45	45	50	
GERD (as % of GDP)	1.82	2.06	2.42	2.57	2.58	2.37	2.2	2		
GBAORD (as % of GDP)	0.68	0.6	0.59	0.53	0.48	0.43	0.41	0.4		
R&D funded by GOV (% of GDP)	0.65	0.73	0.76	0.74	0.69	0.52	0.44			
BERD (% of GDP)	1.17	1.4	1.79	1.95	1.97	1.83	1.68	1.51		
Research excellence composite indicator (Rank)	18	20	20	20	20	20				
Percentage of scientific publications among the top 10% most cited publications worldwide as % of total scientific publications of the country		7.98	7.3	8.75	7.57	8.29				
Public-private co-publications per million population	72.33	79.14	98.04	74.92	77.23	82.48	41.2			
World Share of PCT applications	0.09	0.09	0.07	0.07	0.07	0.08	0.05			
Global Innovation Index				30	28	28	32	32		

Data sources: various, including Eurostat, European Commission and International scoreboard data.

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